Magelona probably originate within cells, from which they are released.

Prof. G. Gilson (Louvain), on the nephridial ducts of *Owenia*.

The Rev. T. R. R. Stebbing, on zoological publication, &c., suggested that the leading biological societies should arrange the work of publishing between them, so as to avoid the overlapping which now takes place. He proposed that for every country there should be a single authorised journal to receive the names of new genera and species with brief descriptions, all claims to priority being dependent on the date of this record.

Mr. J. T. Cunningham, on the significance of diagnostic characters in the Pleuronectidæ, discussed the evolution of the characters which distinguish flat-fishes into subfamilies, genera, and species. He considers that the specific and many of the generic characters are not known to be adaptational, and are more probably due to generative isolation and divergent variation. His general conclusion is that animal variation is to be regarded as the resultant of two opposing influences, one internal and one external to the organism. The one is the internal tendency to definite divergent variations which have no direct relation to the struggle for existence, the other is the direct influence of adaptation, whether due to the selection of individuals or to the direct modification of individuals.

Mr. Goodrich described some of the methods adopted recently in displaying specimens in the zoological part of the Oxford University Museum. Dr. F. A. Dixey, on the plantar surface in infants, showed that his investigations on the skin of the foot in very young infants who had never walked, do not lend any support to the view that acquired characters can be transmitted by heredity.

Mr. W. E. Collinge, in a paper on the relations of the cranial nerves to the sensory canal system, showed that the canals are innervated in the Elasmobranchs chiefly by the facial nerve, in the Ganoids by the trigeminal and facial, and in the Teleostei chiefly by the trigeminal. Dr. H. B. Pollard exhibited, with remarks, models of the cranial skeletons of some rare South American and African siluroid fishes, made after the method of Born, with the addition that they were electroplated in order to give them sufficient firmness. Attention was drawn chiefly to the barbules round the mouth. These were maintained to be the homologues of the oral tentacles of *Myxine* and the cirri of *Amphioxus*, and a new theory of the origin of the head in Vertebrata, termed the cirrhostomial theory, was based on these homologies. The author contrasted this theory with the old vertebral theory of Goethe and Oken, and the subsequent theories of Gegenbaur, Balfour, v. Wijhe, and others.

GEOGRAPHY AT THE BRITISH ASSOCIATION.

AT the Oxford meeting the popularity of the Geographical Section showed no abatement. Crowded meetings were the rule, even when papers of a severely scientific character were being read. This may be explained to some extent by the favourable situation of the section-room in close proximity to the reception-room; but perhaps the general use of lantern illustrations had more to do with it. By means of effective lantern diagrams the audience was able to follow with interest and pleasure, papers on detailed oceanography and climatology. The characteristic of the meeting may be given as the general high level of the papers offered, and the interesting discussions to which they frequently gave rise.

The President, in his address, dealt with oceanography in its widest sense, and was followed by a number of papers of similar character, though narrower scope. Unfortunately, it was found impossible for papers on similar subjects to be taken in all cases on the same day, as the convenience of the authors frequently made it necessary to alter the provisional arrangements which had been made. Mr. H. N. Dickson gave an account of the share he had taken on board H.M.S. *Jackal* in the international oceanographical observations initiated by Prof. Petterson, of Stockholm. The general conclusions arrived at were as follows:—

While the Atlantic current flowing over the Wyville-Thomson ridge attains its maximum velocity in winter, its speed is maintained during summer by the greater warmth of the upper layers of water in the Atlantic, and consequent higher level of the surface of that ocean compared with the Norwegian Sea. Passing over the ridge, the Atlantic current is cooled by mixture with the cold water of the Norwegian sea lying at the bottom of the Faeröe-Shetland Channel, and loses its horizontal motion. The warmer the Atlantic current the more rapidly does this mixture take place. Hence in a hot, windless summer a mass of Atlantic water, extending to a great depth, tends to collect on the northern and north-western edge of the North Sea bank. At all seasons Atlantic water is drawn from the Faeröe-Shetland Channel and forced into the North Sea by the tides between Orkney and Shetland. The tidal streams run north-west and south-west, and an eddy is formed to the north-west of the Orkneys, into which North Sea water is drawn, and perhaps also water from below. As the season advances the surface water of the North Sea becomes warmer, the upper layers probably receive smaller supplies of fresh water, but they become specifically lighter than the under layers, which they protect from the warming influences of the atmosphere. The upper layers becoming ultimately warmer than the Atlantic current, the surface of the North Sea becomes higher, and the surface water spreads outwards into the Faeröe-Shetland Channel, checking the surface supply of Atlantic water. Meanwhile, the mass of Atlantic water, collecting at the edge of the North Sea Bank, seeks entrance into the North Sea. Mixing with the cold bottom water already there, it increases its salinity, but reduces its specific gravity by warming it, and, at a certain stage of mixture, the temperatures and salinities of the two waters combine to form a ridge or axis of maximum specific gravity. This axis, which probably runs north-east from Shetland in the end of May or in June, turns slowly toward a north to south direction, and moves eastward. As it retreats, Atlantic water is gradually admitted round the north end of the Shetlands, passes down the east side of the groups, joins the tidal stream at the south end, and, guided by the axis of heavy water, is distributed along the east coast of Scotland, probably during July and August. Later in the summer, as the axis retreats still further, the Atlantic water is probably distributed more towards the eastward, perhaps until the latter part of September, when the diminishing supply from the Faeröe Channel, and the increasing outflow from the eastern side of the North Sea, bring about a gradual return to the conditions with which we started. Obviously the controlling conditions are complex, but it appears that the greater the winter cold and the spring supply of ice-cold water from the continent, the more slowly will Atlantic water penetrate into the North Sea below the surface; and the warmer the summer, the more will the surface supply be checked. At the same time, the warmer the summer the larger the quantity of Atlantic water seeking admission, and the greater its thermal power to drive back the axis of maximum weight.

M. A. Delebecque, of Thonon, sent an account of his methods of surveying and constructing bathymetrical maps of the French lakes, a series of which was exhibited. The geographical conditions of the English lakes were described by Dr. H. R. Mill, and in the discussion which ensued, Prof. Guido Cora, of Turin, took a leading part. Mr. J. Y. Buchanan, F.R.S., sent an account of the researches being carried out by the Prince of Monaco and himself on board the Prince's yacht *Princesse Alice*, in the Mediterranean and North Atlantic, which received considerable attention. He found that even at a distance of 600 miles south-west of the Strait of Gibraltar the salt water from the Mediterranean occupied the lower half of the whole depth, the upper half alone being occupied by Atlantic water. Numerous observations were made in the narrowest part of the Straits, with the effect of defining the manner in which the surface current of Atlantic water entering the Mediterranean is related to the deeper current of dense water escaping to the ocean.

Dr. John Murray gave a discourse on the geographical and bathymetrical distribution of organisms in the ocean, focussing all our knowledge of the distribution of marine life, and concluding with the belief that the existing distribution is a result of the gradual restriction of a universal fauna which flourished in a climate of world-wide warmth, possibly due to the larger size of the sun. This paper gave rise to an animated discussion. Although not formally organised, this was practically a joint discussion between Sections D and E, the participants in the discussion comprising Dr. Gunther, Mr. P. L. Sclater, Dr. O. Maas, Canon Norman, Dr. H. O. Forbes, and Mr. Garstang.

Papers dealing with new exploration were unusually numerous.

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Mr. Osbert H. Howarth gave a magnificent series of new views of the Cordillera of North America, in illustration of a paper on the Sierra Madre of Mexico, from which he had just returned. Mr. D. G. Hogarth summarised the result of his recent journey in the valley of the Euphrates. The river was found to be so difficult of passage as to form a natural frontier of the most effective kind. Very fine remains of Roman bridges, aqueducts, and forts were found and photographed. Mr. Weld Blundell, just returned from an even more adventurous journey in the Libyan Desert, gave a paper full of interest describing his observations and photographs. Dr. A. Markoff gave a comprehensive general description of Russian Armenia. Travel papers of minor importance, but no less popular on that account, were read by Mr. W. H. Cozens-Hardy on Montenegro, and by Miss Baildon on a visit to New Guinea.

An animated discussion was also called forth in connection with a valuable paper by Mr. Somers Clarke, on the geography of Lower Nubia. He vividly described the scenery and present economic state of the site of the proposed great Nile reservoir. He said that the Wadi Kenus, the abode of the Beni Kensi tribe, is nearly coincident with the projected Nile reservoir, and if the proposed scheme is carried out the population to be displaced numbers about 30,000, inhabiting a cultivated area of some 10,000 acres. Population in the Ptolemaic times must have been greater, as there are tracks about Korti and Dakkeh, once under cultivation, now abandoned. In the Dodeka-Schoenus there is a number of temples and remains of antiquity, a further proof of considerable population; and the district is protected by a line of forts, some of very high antiquity, others of later date. The existence of Egyptian civilisation side by side with the ruder customs of the natives, is especially to be observed in the method of burial. The present inhabitants on the course of the Nile valley from Assuan to Wadi Halfa exhibit very slight variations in modes of dress, particularly among the women. Men go to Cairo, women stop in the villages, so that the men adopt the ordinary dress of fellahin in Egypt. The manner of building houses from lumps of earth, crude brick, with flat wooden or vaulted brick roofs, constructed in the same way as those used by the ancient Egyptians, was noticed. Reed shelters are also in use. Not only the unique antiquities but the present people, with all life, animal and vegetable alike, are affected by the projected reservoir. In view of the contemplated destruction it is of the utmost importance to make an exhaustive scientific investigation of the valley before it is submerged.

Mr. Norman Lockyer, in commencing the discussion on this paper, said that if the dam were constructed it might after all, if preceded by an exact scientific survey, prove to be a blessing in disguise even to Egyptologists, and that the advancement of science and the advancement of Egypt might proceed hand in hand.

Papers of more technical interest were contributed by several authors. Mr. A. Montefiore sent a detailed account of the equipments of the Jackson-Harmsworth Arctic expedition; Mr. John Thomson gave an account of the methods of photography best adapted for the use of travellers; and Mr. B. V. Darbishire showed a new method of representing the surface configuration of the British Islands. Mr. G. G. Chisholm initiated a valuable discussion on the spelling of geographical names, the purpose of which was to show that the indispensable preliminary requirement, with a view to the end stated, is to have an adequate scheme of orthography, making up for the deficiency of such signs by clear rules to be followed with respect to the sounds for which signs are lacking. To leave it to the individual judgment to decide what is the nearest sound represented in the scheme to one for which no express provision is made, is bound to lead to confusion. The inadequacy of the latest version of the Royal Geographical Society's scheme from this point of view was pointed out, and suggestions of remedies made. The addition of some subordinate rules likely to promote the efficiency with which the scheme is carried out was recommended. Attention was drawn to special difficulties in connection with Russian and Greek names, and reasons given for entertaining the hope that, with the aid of Oriental scholars, special rules might usefully be framed with regard to the spelling of Chinese and Indo-Chinese names. Finally, it was urged that, once an adequate scheme clearly expounded is adopted, it would be of great importance to make special arrangements to secure the co-operation of all contributors to the *Geographical Journal* and other geographical periodicals, of publishers and authors, and, above all, of the newspaper press towards getting the scheme carried out.

Mr. H. Yule Oldham attracted much attention to his statement of evidence, from a MS. map at Milan, of date 1448, of the discovery of Brazil before that date. In the long discussion which followed, the evidence was criticised by several speakers who were reluctant to accept it without more ample proof.

Colonel Feilden read a brilliant paper on current polar exploration, in which he explained the position of the various expeditions now in the field, and expressed a strong opinion as to the folly of inexperienced travellers adventuring themselves lightly into regions so fraught with danger.

Mr. E. G. Ravenstein presented a discussion of the climatology of tropical Africa, resulting from the observations collected by the Committee on African Climate appointed some years ago. The results present the first satisfactory generalisations on the tropical climates of Africa, but its scope cannot be conveniently summarised. Mr. Theodore Bent gave an admirably illustrated account of his recent visit to the Hadramut in Southern Arabia. The proceedings of the Section were assisted by several eminent foreign geographers, amongst whom Prof. Vambery, of Budapest, and Prof. Guido Cora, of Turin, took a leading place.

MECHANICS AT THE BRITISH ASSOCIATION.

THE sittings of Section G, at the recent meeting of the British Association at Oxford, were held in the Common Hall of Keble College, which afforded more than ample accommodation for the purpose.

We have already printed the presidential address of this Section. Prof. Kennedy, who some time ago resigned his chair, was one of the pioneers of the modern movement towards technical education in mechanical engineering, and it was natural, therefore, that he should largely deal with the training of engineering students in his address.

There was a very long list of papers down for discussion at the meeting. The first sitting was held, according to custom, on the Thursday, and the Section met on the Friday, Saturday, Monday, and Tuesday following, that is to say, from August 9 until August 14. With so long a list of papers to deal with, we can do no more in the space at our command than simply refer to some of them by name, and we therefore give the following, which is a complete list of the papers read:—

Thursday.—(1) Some reminiscences of steam locomotion on common roads, by Sir F. J. Bramwell, F.R.S.; (2) bore-hole wells for town-water supply, by H. Davey.

Friday.—(1) Joint meeting with Section A:—(*a*) On integrators, harmonic analysers and integraphs, and their application to physical and engineering problems, by Prof. O. Henrici, F.R.S.; (*b*) note on the behaviour of a rotating cylinder in a steady current, by Arnulph Mallock; (*c*) on the resistance experienced by solids moving through fluids, by Lord Kelvin, P.R.S.; (*d*) discussion on flight, in which Lord Rayleigh, Mr. Langley, Mr. Maxim, and others took part; (2) the strength and plastic extensibility of iron and steel, by Prof. T. Claxton Fidler; (3) tunnel construction by means of shield and compressed air, with special reference to the tunnel under the Thames at Blackwall, by M. Fitzmaurice.

Saturday.—(1) On methods that have been adopted for measuring pressures in the bores of guns, by Sir Andrew Noble, K.C.B., F.R.S.; (2) the most economical temperature for steam-engine cylinders, by B. Donkin.

Monday.—(1) Signalling through space, by W. H. Preece, F.R.S.; (2) some advantages of alternate currents, by Prof. S. P. Thompson, F.R.S.; (3) continuous current distribution of electricity at high voltage, being a description of the lighting of the city of Oxford, by T. Parker; (4) a special chronograph, by H. Lea; (5) a direct-reading platinum pyrometer, by G. M. Clark.

Tuesday.—(1) Report of committee on dryness of steam, by Prof. W. C. Unwin, F.R.S.; (2) the temperature entropy diagram, by H. F. Burstall; (3) the hunting of governed engines, by J. Swinburne; (4) engineering laboratory instruments and their calibration, by Prof. D. S. Capper; (5) lighthouse apparatus and lighthouse administration in 1894, by J. Kenward; (6) on spring spokes for bicycles, by Prof. J. D. Everett, F.R.S.

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